

18 p 21 cm 24
but that is not by any means the sort of field in which coal is found.

In the first place, we all know that coal ^{lies} ~~is found~~ underground in a mine. Suppose a coal master is going to open a new pit. He chooses a likely spot for coal but at present, perhaps, sees nothing but a pretty common. But geologists can tell by the sort of rock which appears at the surface whether coal is likely to be found underground.

The first thing is to bore a hole deep down into the earth ^{by means of} ~~with~~ sort of bit at the end of an iron rod. As the hole is not large enough for a man to follow the chisel, it is driven by a machine. This boring tool is so contrived that part of it can be drawn up ^{any} now & then with a bit of the ground it is working through, that the men at the top may see whether it is going through grit, or clay, or coal. If the boring tool brings up coal often, the coal master ^{knows} that he has found a good place for his pit.

This is how it is: in a coal field the coal lies in a number of layers or strata separated from one another by layers of silty clay, called shale, or coarse, hard sand stone called grit, forming altogether what are known as coal measures. That is, beds of sand stone, shale, clay, & coal lie one below another, some below another to a great depth.

The layers of coal called seams are generally thin. They are wide enough, stretching under a great piece of country, but are often only a few inches deep, & are hardly ever more than the height of a man in thickness. The

1874

The beds of grit & shale between the coal-seams are much thicker than the coal itself. Many different seams of coal lie however, under one another at the same spot.

When the coal-master has found a coal-measure with a good many seams of coal, the next thing is to sink a shaft. A shaft is a hole deep enough to reach a good thick coal seam, wide enough ^{to allow} for men, horses, carts & the covered to the coal.

When the miners reach a thick seam, they drive a broad passage through it reaching from top to bottom, from roof to floor. This is called the mother gate: gate is the north-country word for a road or way, & this is the mother gate, & many passages are driven from it on either side. When all the gates have been driven, the coal-miner looks something like a town with many streets, some wide & some narrow, with great pillars of coal here & other like buildings.

The miners are lowered into the deep darkness of this underground town darkness so black, that the darkest night would seem bright compared with it. All the light they have is from the candle or little lamp which each man carries in his hat. Every man has his own place in the mine, & each sets to work with his pick to hew out the walls of coal. The coal is thrown into buckets, which are drawn along tramways to the great shaft: There it is put into waggons which are again drawn to the surface.

The colliers often work in galleries so low & narrow that they cannot stand upright, or even sit but crouch in

1873 MC34

a stoppage posture for hours together, working by the
flames of a small candle ^{which is carried in the cap,} just or six hundred feet
down in the bowels of the earth. Often he must
make his way through a mile or two of underground
passages to get to his work.

It is this all: the respectless plowing & sowing
may break in & crush him. The earth's crust
is always pretty full of water, the water which
soaks in after every rain; though engines
are kept at work to pump it up & keep the
pits dry, & sudden rush of water may
burst through at any time, fill the galleries,
& drown the miners. The air, too, is close & bad
in these deep pits, often bad enough to poison
a man, though great pains are taken to keep
it moving in such a way as to make a
constant draught right through the mine.

This is another danger more terrible than
these. In an instant, in the most violent
manner, the mines may be scorched & shrivelled
to a blackened mass, or shattered to pieces
against the sides of the mine; - in a great pit
may break out suddenly & fill the pit with
death.

We all know that the gas with which our houses
are lighted is made from coal; & that if this
gas is allowed to escape so as to fill a room, a
lighted candle taken into such a room would
set the house on fire.

Coal gives off a great deal of such inflammable
gas in the pit. This gas mixes with the
air & moves along with it; this is why it is so
necessary to keep a constant draught through
the mine, so that the gas should be carried to the
shafts by which it ^{may} escape. Then, again, ^{and}

now when the collier lays open with his pick
a hole in the coal which is quite full of this gas, as
the workmen call it, fire-damp which rushes
out with a blowing noise.

So heaven with his lighted candles came in
the way of such a blow, sending out a torrent
of gas the gas would blaze up, the flame would
spread like lightning to the other gas all over
the mine, shattered by the explosion & struck
in the fierce heat, horses & men would come
to a terrible end, from which there is no
way of escape.

What is this precious coal upon which we depend
not only for the working of our great mills but
for help to comfort of our lives? A black stone, like
numerous diamonds of the earth, you think. That
is what it is now certainly. But many many
ages ago, when this ^{Yokohama} great coal field was
there was an enormous forest of ~~made~~ of trees
unlike any we have now of huge tree ferns
& mosses, club mosses, which grew to the
height of fifty or sixty feet.

This great forest grew by the sea side, (the sea came
much further in, in those days), & the land was slowly
slowly sinking. Every now & then the ^{land} ~~land~~ came
in amongst the trees, & went out again. Rooms
much sand behind it. And this went on so
long that the forest was buried in sand. As
ages went on, the sand grew deep in the top of the
old forest, soil gathered on the sand, & another
forest grew on the side of the first - only to be
buried again in its turn.

During countless ages thus from the recovering
uplifts, until, in some places as many
as a hundred forests ~~up~~ grew in the
course

hills which lie between the River & the Calver: & rather the heart of the town is in the valley, not you cannot get into any of the pleasant suburbs or even into the best streets perhaps without going up hill. From any hill-side round the town you may see Bradford lying in the hollow. The houses thickly clustered, & church steeples here & there, & small chimneys - something like two hundred of them - rising everywhere, sometimes scattered far apart & sometimes gathered together by the score. That is you can see all this if the smoke from these tall chimneys does not hang so heavy over the town that there is no view to be had.

The hills in the middle of which Bradford lies are composed of good building stone & many are green quarry scars, & their sides. Therefore Bradford is built of stone & is for the most part a much handsomer town than if red brick, which is apt to get dingy & shabby, were the material used in its building.

There is a fine town-hall, with a tall bell-tower from which pleasant tones are heard upon the evening air, as well as a good many other handsome public buildings. And there with the streets of tall well built houses & the good shops on the town, & the pleasant villas of the merchants & manufacturers & its outskirts, give Bradford a 'well-to-do' appearance.

We have no space to describe the excellent schools, & the places of education. The libraries, the Blind Institute, nor any of the excellent schemes for the education of the people & the aid of the unfortunate which here, as in Leeds & in other Yorkshire towns, speak well for the public spirit.

spirit; ~~generally~~ ^{and} ~~good sense~~ ^{and} ~~wisdom~~ ^{of the towns people.}

In Bradford, as in Leeds the mills are the most
magnificently building, of the town but they are, at the
same time, the most interesting. Here we made
the ^{appearance of} ~~merchandise~~ ^{up} dress stuffs with many
names manufactured for ladies dresses
willed cloths for ~~their~~ ^{their} jackets & shawls for trimming
~~also~~ ^{with other materials} ~~that~~ ^{will} nothing less than silk &
velvet ~~decorations~~ ^{do for you?} Even then you
may get everything you want of Bradford

make every excellent quality.
The 'Mansfield Mill' - a palace for silk
~~handloom~~ ^{appears} ^{as} the largest manufacturing
of the kind in England. Here some 3,000 hands
are employed. Produces silk velvet goods of
every kind; and most curious & interesting
as all the processes through which the delicate
web of the silkworm goes before it passes into
the hands of the dressmaker. But we have no
space to describe this very important manufacture.

The work people themselves interest us more.
after all. Now at the wonderful machinery of
the mills; the "mill-hands" of ^{the West-riding} ~~Yorkshire~~ are
pleasant folk to know. They have as completely
homes as any work people in England when they
are sober, industrious, clean & careful. ^{In their houses} ~~They~~ ^{have} as completely
a bright, pleasant living room, with a good chest
of drawers & sofa, every likely, & peace in it, with
ornaments & pictures, & sometimes a well-filled
book case; while the inviting ^{adorn} ~~small~~ of Yorkshire
'baking' shows that the family will not starve
for a day or two at any rate. And it often happens
that the father has paid into a building society while
the house he lives in is his own.

Bradford

Bradford is not a town with a very interesting history. ^{During} In the days of the Civil War (1642-1647) when the King Charles I. & the Parliament took up arms against each other, & almost every town in the Kingdom sided with one party or the other, Bradford was on the side of the Parliament. The King's army under the Earl of Newcastle attacked the town, & the parish church was used as an hospital for the wounded, the townsmen hitting with clever devices of hanging wood. pecks round the tower to receive the shot of the enemy.

Yorkshire was, for the most part, on the King's side, but the town of Fairfax, Lord Fairfax's son, Sir Thomas, who belonged to an ancient Yorkshire family, fought valiantly against the royal forces under the Earl of Newcastle. Sir Thomas Fairfax has left an account of the actions in which he & his father were engaged, containing interesting facts with regard to towns of Leeds & Bradford.

The Narratives of Sir Thomas Fairfax.

'We being at Leeds, it was thought fit to possess some

Come other place; therefore Lewis sent to Bradford, with
seven or 800 foot, a whole troop of horse. Then two
troops were all the garrison we had, sent Wakefield
six miles off camp 3.000 of the evening; but they
did not much disturb us."

However, Sir Thomas led his men against
Halifax, & gained a victory there, taking many prisoners.
That "the earl of Newcastle

Then came the news that "the earl of Newcastle
marched with an army of 10 or 12,000 men to sit
down before ~~Besiege~~ Bradford, which was a place
without walls or any means of defence.
... all the force he could get.

"Neither my father drew ^{up} all the force he could get, but seeing it impossible to defend the town otherwise than by strength of arms, what we had at about 1000 12 days' provisions; we resolved, the next morning very early, with a body of 3000 men, to attempt his whole army, retiring camp in their quarters three miles off." — a man outside the town.

miles off." ^{took place on a mountain outside the town.}
The charge was made with some resolution, but
the enemy began to think of retreating when
our Colonel Smith desired his men to let
him charge once with a stand of pikes, with which
he broke in upon our men, who lay prostrate,
being herewith discouraged. ^{the explosion was} ~~some~~ ^{soon} routed,
and came forward to retreat when

11 Then a command came for us to retreat when
there was clear advantage to do so - the enemy
being almost 4000 yds. about us. Some way to
Bradford cut off. But there was a lane in the
field we were in which led to Halifax. This brought us

11 After this ill success we had small hopes of better, wanting all things necessary in Radford in the defence of the town, and expectation of help from some place. The east of Newcast presently besieged the town, but before he had surrounded it. 2 Jan

18p30m234
That men I had brought from Halifax. I found
my father much troubled, having neither a place of
strength to defend ourselves in, nor a garrison in
Yorkshire to retreat to, for the governor of Hull had declared
York was forced to retreat thither, he would shut the gates
on us. But we got a friendly message from the townsmen.
"My father having ordered me to stay here (in Bradford),
retired that night to Leeds to secure it."

"The earl of Newcastle spent three or four days in Croy,
his quarters about the town of Bradford; he brought
down his cannon, but needed not to raise
batteries, for the hills commanded all the town.
Being planted in two places, they shot furiously
upon us, which made us spend very much of our
little store of powder at the beginning of the siege."

"After some very hot fighting, we had not above
one barrel of powder left: a match: I called the
officers together, it was resolved to draw off
presently before it was day, & to retreat to Leeds by
going a way, which we must do, for they had surrounded
the town."

"Orders were given & soon put in execution. My
post (~~soldiers~~) was sent out through some narrow
lanes, & I myself went with the horse artillery
a more open way."

"I must not here forget my wife, who ran the same
hazard with us in this retreat, without laying
anything of her fears: not because she took
pleasure in war, but because she was patient
in bearing what could not be helped."

"The day beginning to break, I saw upon the hills
above us about 300 horse of the enemy. Myself
& three more broke through, but the enemy fell
upon the rest & soon routed them, taking most
of